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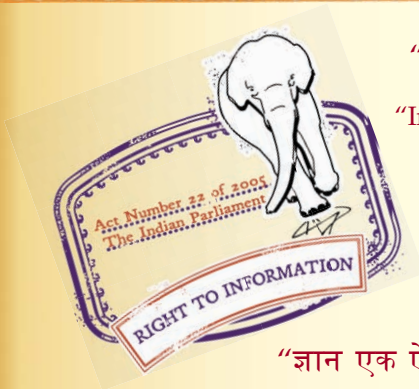
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IS 4517 (1986): Brush, welder's [CHD 24: Brushware]



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IS : 4517 - 1986

(Reaffirmed 2002)

Indian Standard
**SPECIFICATION FOR
BRUSHES, WELDERS'**
(First Revision)

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INDIAN STANDARDS INSTITUTION
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

Indian Standard

SPECIFICATION FOR BRUSHES, WELDERS'

(*First Revision*)

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Indian Standard
**SPECIFICATION FOR
BRUSHES, WELDERS'**
(First Revision)

0. FOREWORD

0.1 This Indian Standard (First Revision) was adopted by the Indian Standards Institution on 30 April 1986, after the draft finalized by the Brushware Sectional Committee had been approved by the Chemical Division Council.

0.2 Welder's brush forms an important part of welding accessories. With the rapid industrialization within the country, welding operations in fabrication work have constantly increased resulting in the increase in demand of welder's brushes. With this background the standard was first published in 1967 so that the production of standard size of welder's brushes could be achieved.

0.3 With the growth of engineering industry in the diverse field since this specification was formulated in 1967, the existing two sizes of this brush have been found inadequate now to meet the varied requirements from different sections of end-users. And as such the sizes of the brush have been increased from the existing two to five in this revision of the specification.

0.3.1 Also, practical difficulties are being experienced at the production stage of the brush to adhere to some of the details stipulated in the existing specification. Therefore, necessary modification in these details have been made in this revisions.

0.3.2 Attempt has also been made to render the specification in a more graphic form as far as possible, in places of descriptive clauses to make this revised version of the specification easily comprehensive so as to extend the scope of implementation of this standard to the village level of this industry which plays a vital role to feed the demand of this product from various sectors.

0.4 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis shall be rounded off in

accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard prescribes the requirements and methods of sampling and test for welder's brush.

2. TERMINOLOGY

2.1 For the purpose of this standard, the definitions given in 2 of IS : 384-1979† shall apply.

3. SIZES

3.1 The width at the brush-heads along with the numbers of rows of the tufts of the filling material shall denote the size of the brush and shall be as follows:

- a) 20 mm — 2 rows of tufts,
- b) 25 mm — 3 rows of tufts,
- c) 40 mm — 4 rows of tufts,
- d) 50 mm — 5 rows of tufts, and
- e) 60 mm — 6 rows of tufts.

4. REQUIREMENTS

4.1 **Materials** — Welder's brush shall be manufactured from the following materials.

4.1.1 *Filling Material* — This shall consist of hardened and tempered bright, blue or black round steel wire 0.30 to 0.355 mm in diameter or as agreed to between the manufacturer and the supplier.

4.1.1.1 *Tuft of Filling Material* — Each tuft shall comprise 16 to 18 numbers of wires (32 to 36 strands when folded) on average or as agreed to between the manufacturer and supplier.

4.1.2 *Drawing Wire* — Bright steel or galvanized iron wire 0.45 to 0.60 mm in diameter.

*Rules for rounding off numerical values (revised).

†Specification for brushes, paints and varnishes, flat (fourth revision).

4.1.3 Nails — Round, 12 mm long and 1.40 mm in diameter.

4.1.4 Staples — Bright iron wire 0.9 to 1.0 mm in diameter.

4.1.5 Timber — Any of the timber species listed in Appendix A shall be used in the manufacture of the wooden portion of the brush.

4.1.5.1 The timber shall be reasonably straight-grained and well-seasoned to a moisture content not exceeding 15 percent when tested by the electronic moisture meter. In case of dispute, the oven-dry method shall be used (*see* Appendix B).

4.1.5.2 The timber shall be free from brashness, any kind of decay rot, insect attack, centre heart (pith), knots (except pin knots), cracks, warp and any other defects which may reduce the life of the brush or affect its utility.

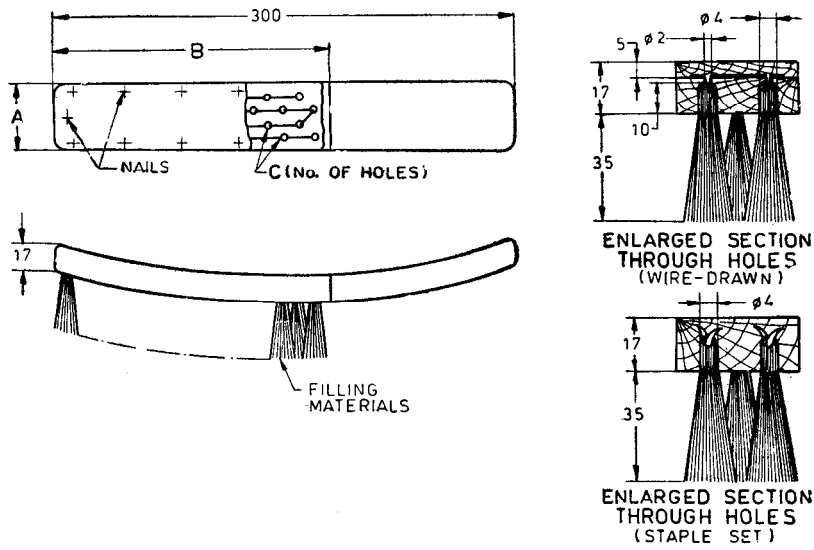
4.2 Dimensions and Tolerances

4.2.1 The brushes shall conform to the dimensions given in Fig. 1A and 1B, and Table 1.

TABLE 1 DETAILS OF BRUSH, WELDER'S

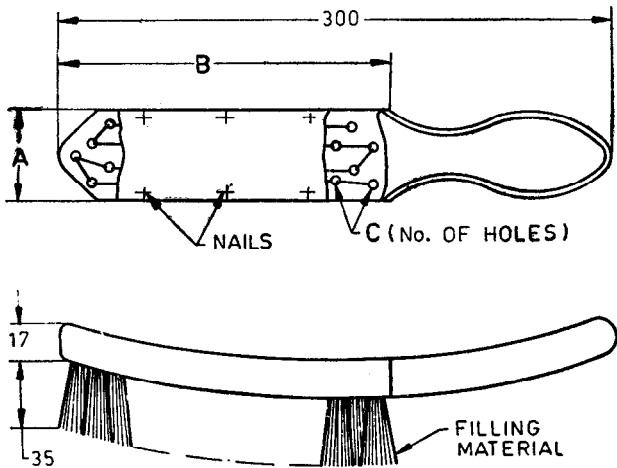
(*Clause 4.2.1 and Fig. 1*)

SL No.	SIZE	WIDTH OF BRUSH A	NO. OF ROWS	BRUSH HEAD B	NO. OF HOLES C
	mm	mm	mm	mm	
(1)	(2)	(3)	(4)	(4)	(6)
i)	20	20	2	160	36
ii)	25	25	3	160	55
iii)	40	40	4	160	60
iv)	50	50	5	180	75
v)	60	60	6	180	90



All dimensions in millimetres

1A Brush Welders, Size 20 mm,



All dimensions in millimetres

1B Brush Welder, Size 25, 40, 50 and 60 mm

FIG. 1 BRUSH, WELDER

4.2.2 The tolerance on the linear dimensions shall be as follows:

<i>Dimensions</i>	<i>Tolerances</i>
Over-all length of the brush	± 5 mm
Protrusion of filling material	± 2 mm
Dia of hole	± 1 mm
Other dimensions	± 2 mm

NOTE — The above tolerances shall not apply for the wires for filling materials, for the drawing wires and for staple wire for which the latitude has been given in their respective clauses.

4.3 Manufacture

4.3.1 The brushes shall generally conform to the shapes, designs and shall fulfil the details of requirements as illustrated in Fig. 1A and 1B, and Table 1. However, the distance of the first hole shall be 10 mm from the edge of the board.

4.3.2 Wire-drawn Brushes — The requisite numbers of tufts shall be drawn with the drawing wire inside the tuft hole and securely fastened at the back of the stock/board of the brush-heads. The wooden back/cover shall be placed suitably and shall be firmly nailed as shown in Fig. 1 for wire-drawn brushes.

4.3.2.1 Staple-set brushes — The requisite numbers of tufts shall be slogged with the staple into the tuft hole and shall be firmly anchored with the wooden stock/board. No back/cover is required.

4.3.2.2 Trimming — The working surface of the filling wires shall be straight-faced for both the wire-drawn and the staple set brushes.

4.3.2.3 Preservation — Suitable rust preventive material shall be applied on the filling material.

4.4 Workmanship and Finish

4.4.1 The wooden portion shall be finished smooth. If the brush is to be kept for a long time, the users may suitably paint it with 5 percent solution of copper naphthanate in petroleum hydrocarbon solvent or zinc naphthanate.

4.4.2 In general workmanship and finish, the brushes shall match the approved tender sample.

4.5 Tests

4.5.0 The filling wire comprising the tufts shall satisfy the following test.

4.5.1 Bend Test — The filling wire shall be capable of being bent to an angle of 180° and when straightened, it shall do so without fracture. When doubled over a mandrel having a diameter of 6 mm, it shall, on release, return to an angle of 45° .

4.5.2 The binding or the anchorage of the each tuft shall remain rigid inside the tuft hole and no filament shall come out when the individual tuft is subjected to a straight pull with thumb and finger grip.

5. MARKING

5.1 Unless otherwise agreed to between the indenter or inspection authority and the supplier, each brush shall be legibly and indelibly marked or stamped with the manufacturer's name or recognized trade-mark, if any, size, and the year of manufacture.

5.1.1 The brushes may also be suitably marked with the ISI Certification Mark.

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act and the Rules and Regulations made thereunder. The ISI Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

6. PACKING

6.1 The brushes shall be packed in packages as mutually agreed to between the indenter or the inspection authority and the supplier.

7. SAMPLING

7.1 Representative samples for test shall be drawn as prescribed in Appendix C.

APPENDIX A

(Clause 4.1.5)

SPECIES OF TIMBER FOR THE MANUFACTURE OF
WOODEN PORTION OF BRUSH, WELDER'S

A-1. The list of species of timber approved for the manufacture of the wooden portion of brush, welder's is given below:

Trade Name		Botanical Origin
Roman	Devanagari	
Aini	ऐनी	<i>Artocarpus hirsuta</i> Lamk., fam. Moraceae
Banati	बनाती	<i>Lophopetalum wightianum</i> Arn., fam. Celastraceae
Bijasal	बीजसाल	<i>Pterocarpus marsupium</i> Roxb., fam. Leguminosae
Champak	चम्पक	<i>Michelia champaca</i> Linn., fam. Magnoliaceae
Chickrassi	चिकरासी	<i>Chukrasia tabularis</i> A. Juss., fam. Meliaceae
Dhaman	धामन	<i>Guswia tilifolia</i> Vahl., fam, Tiliaceae
Gamari (gumhar)	गमारी (गुम्हार)	<i>Gmelina arborea</i> L., fam. Verbenaceae
Haldu	हलदु	<i>Adina cordifolia</i> Hook. f., fam. Rubiaceae
Kaim	कैम	<i>Mitragyna parvifolia</i> (Roxb.) Korth., syn. <i>Stephegyne parvifolia</i> Korth., fam. Rubiaceae
Kanju	कांजू	<i>Holoptelea integrifolia</i> (Roxb.) Planch., fam. Ulmaceae
Kathal	कटहल	<i>Artocarpus heterophyllus</i> Lamk., syn. <i>A. integrifolius</i> Auct., fam. Moraceae
Kuthan	कुथन	<i>Hymenodictyon excelsum</i> Wall., fam. Rubiaceae

Trade Name		Botanical Origin
Roman	Devanagari	
Lambapatti	लम्बापत्ती	<i>Planchonella longipetiolatum</i> H.J. Lam, syn. <i>Sideroxylon longipetiolatum</i> King & Prain, fam. Sapotaceae
Aam (mango)	आम (मैन्गो)	<i>Mangifera indica</i> Linn., fam, Anacardiaceae
Nim-chameli	नीम-चमेली	<i>Millingtonia hortensis</i> Linn. f., fam. Bignoniaceae
Kodapalai chou-paini (piney)	कोडपलई चौपेनी (पिने)	<i>Kingiodendron pinnatum</i> Harms, syn. <i>Hardwickia pinnata</i> Roxb., fam. Leguminosae
Toon	तून	<i>Toona ciliata</i> Roem., syn. <i>Cedrela toona</i> Roxb., fam. Meliaceae

APPENDIX B

(Clause 4.1.5.1)

DETERMINATION OF MOISTURE CONTENT OF TIMBER

B-1. TEST SPECIMEN

B-1.1 The entire block used in brush, welder, may form the test specimen for the determination of moisture content, or a coupon cut from the test specimen may, as well, be used for moisture content determination. When for any reason additional determination of moisture content is required, separate samples shall be prepared from the sample material as is used in preparing the test specimens. Smaller specimens may be used when deemed necessary. The test shall be carried out immediately after cutting the specimen.

B-2. PROCEDURE

B-2.1 Weigh accurately each test specimen. This specimen shall then be dried in a ventilated oven at a temperature of $105 \pm 2^\circ\text{C}$ until the mass becomes constant between two successive weighings made at an interval of not less than one hour.

B-3 CALCULATION

B-3.1 Moisture content,
percentage of the oven-dry mass = $\frac{M_1 - M_0}{M_0} \times 100$

where

M_1 = initial mass in g of the test specimen, and

M_0 = oven-dry mass in g of the test specimen.

A P P E N D I X C

(Clause 7.1)

SAMPLING OF BRUSH, WELDER'S**C-0. GENERAL**

C-0.1 The supplier shall submit three identical brushes for approval.

C-0.2 The indenter or the inspection authority shall retain one of the three samples approved against each item till the completion of the order.

C-1. SCALE OF SAMPLING

C-1.1 Lot — In any consignment, all the brushes of the same size and quality shall be divided into groups of 500 brushes or less and each such group shall constitute a lot. Care shall be taken to ensure that brushes included in a lot do not differ in construction, as far as possible.

C-1.1.1 The conformity of the brushes in a lot to the requirements of this specification shall be ascertained for each lot separately. The number of brushes to be selected for this purpose shall be in accordance with col 1 and 2 of Table 2.

C-1.1.2 The brushes shall be selected at random. To ensure randomness of the selection one of the following procedures is recommended for use:

- a) If all the brushes in a lot are packed in one box, then starting from any brush, count them in any suitable order as 1, 2, ... up to r and so on, where r is the integral part of N/n (N and n being the lot size and sample size respectively). Every r th brush thus counted shall be withdrawn to constitute the sample.

- b) If the brushes in a lot are packed in more than one box, approximately equal number of brushes shall be picked up at random from as many boxes as possible so as to obtain the required number of brushes as specified in Table 2.

TABLE 2 SCALE OF SAMPLING

(Clauses C-1.1.1 and C-1.1.2)

No. OF BRUSHES IN THE LOT <i>N</i>	No. OF BRUSHES TO BE SELECTED <i>n</i>
(1)	(2)
Up to 10	2
11 to 25	3
26 to 50	4
51 to 100	5
101 to 150	6
151 to 300	7
301 to 500	8

C-2. CRITERIA FOR CONFORMITY

C-2.1 For declaring the conformity of the lot to the requirements of this specification, all the brushes selected according to **C-1.1.2** shall satisfy the relevant requirements given under 4.

NOTE — For workmanship and finish (*see 4.4*), the brushes selected according to **C-1.1.2** shall be matched with the approved tender sample which shall be suitably stamped and sealed by the indenter or the inspection authority and the supplier, and kept at a place agreed to between the two.



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